

WHAT IS CLAIMED IS:

- 1 1. A method of operating a system to process image data
2 for storage and retrieval, the method comprising the steps
3 of:
4 analyzing said image data to be encoded to
5 determine, for each image represented by the image data, a
6 level of encoding complexity;
7 encoding said image data according to a first
8 encoding format to generate first encoded image data; and
9 storing with the first encoded image data
10 encoding complexity level information indicating at least
11 one determined level of encoding complexity associated with
12 the first encoded image data.
- 1 2. The method of claim 1, further comprising the step of:
2 retrieving the first encoded image data and
3 encoding complexity level information from the storage
4 device;
5 decoding the first encoded image data to generate
6 decoded image data;
7 determining at least one encoding parameter to be
8 used to re-encode the decoded image data as a function of
9 the retrieved encoding complexity level information; and
10 re-encoding the generated decoded image data
11 using the encoding parameter determined as a function of
12 the retrieved encoding complexity level information.

1 3. The method of claim 1, further comprising the steps
2 of:

3 performing an automated image content analysis
4 operation on at least one image represented by said image
5 data; and

6 storing, with the first encoded image data, image
7 content description information generated by performing
8 said content analysis operation.

1 4. The method of claim 3, further comprising the steps
2 of:

3 receiving image content information from a user
4 of the system; and

5 storing, with the first encoded image data and
6 the image content description information generated by
7 performing said content analysis operation, the image
8 content description information received from the system
9 user.

1 5. The method of claim 3 further comprising the steps of:

2 retrieving the first encoded image data and image
3 content description information from the storage device;

4 decoding the first encoded image data to generate
5 decoded image data;

6 determining at least one encoding parameter to be
7 used to re-encode the decoded image data as a function of
8 the retrieved image content description information; and

9 re-encoding the generated decoded image data
10 using the encoding parameter determined as a function of
11 the retrieved image content description information.

1 6. The method of claim 1, further comprising the step of:
2 selecting, based on the determined encoding
3 complexity level information, an image represented by the
4 first encoded image data, to be viewed after decoding.

1 7. The method of claim 6, further comprising the step of:
2 decoding the encoded image data representing the
3 selected image to generate decoded image data; and
4 displaying the decoded selected image on a
5 display device.

1 8. The method of claim 7, wherein said step of decoding
2 the encoded image data is performed as part of said
3 encoding step.

1 9. The method of claim 1, further comprising:
2 selecting the first encoding format from a
3 plurality of supported encoding formats, as a function of
4 the determined level of encoding complexity.

1 10. The method of claim 9, further comprising the step of:
2 receiving data storage limitation information;
3 and
4 wherein the step of selecting the first encoding
5 format is also performed as a function of the received data
6 storage limitation information.

1 11. The method of claim 1, further comprising the step of:
2 retrieving the first encoded image data and
3 encoding complexity level information; and

4 using the retrieved encoding complexity level
5 information to identify at least one data format suitable
6 for distributing an image represented by the first encoded
7 image data, the identified data format being different from
8 the first encoding format.

1 12. The method of claim 11, further comprising the step
2 of:

3 presenting to a user of the system a plurality of
4 data formats suitable for distributing the image
5 represented by the first encoded image data, the identified
6 data format being one of said plurality of presented data
7 formats;

8 receiving from the user information selecting one
9 of the presented data formats for use in distributing the
10 image; and

11 converting at least a portion of the first
12 encoded image data from the first encoding format to the
13 user selected data format.

1 13. The method of claim 1, wherein the step of analyzing
2 image data to be encoded to determine, for each image
3 represented by the image data, a level of encoding
4 complexity includes:

5 generating an activity measure for at least one
6 image represented by said image data.

1 14. The method of claim 1, wherein the step of analyzing
2 image data to be encoded to determine, for each image
3 represented by the image data, a level of encoding
4 complexity includes:

5 generating a measure of the luminance variance
6 throughout at least one image represented by said image
7 data.

1 15. The method of claim 1, wherein the step of analyzing
2 image data to be encoded to determine, for each image
3 represented by the image data, a level of encoding
4 complexity includes:

5 generating a measure of the chrominance variance
6 throughout at least one image represented by said image
7 data.

1 16. The method of claim 1, wherein the step of analyzing
2 image data to be encoded to determine, for each image
3 represented by the image data, a level of encoding
4 complexity includes:

5 generating a measure of the motion between at
6 least two complete frames, each frame corresponding to a
7 different image.

1 17. The method of claim 1, further comprising:

2 generating true motion vectors indicating motion
3 between a first image and a second image;

4 generating in accordance with the first encoding
5 format, as part of said step of encoding said image data, a
6 set of motion vectors indicating motion between said first
7 image and said second image, said set of motion vectors
8 including at least some motion vectors which are different
9 from said true motion vectors; and

10 storing the true motion vectors with the first
11 encoded image data which includes said set of motion
12 vectors.

1 18. A method of operating a system to process image data
2 for storage and retrieval, the method comprising the steps
3 of:

4 performing an automated scene analysis operation
5 on said image data to be encoded to generate image content
6 information;

7 encoding said image data according to a first
8 encoding format to generate first encoded image data; and

9 storing the generated image content information
10 in a file with the first encoded image data.

1 19. The method of claim 18, further comprising:

2 receiving additional image content information
3 from a user of the system;

4 storing the additional image content information
5 in said file with the first encoded image data;

6 retrieving from storage the stored first encoded
7 image data, said generated content information, and said
8 additional content information;

9 selecting a second encoding format to be used for
10 outputting images represented by said first encoded image
11 data as a function of at least one of said generated
12 content information and said additional content
13 information; and

14 re-encoding said first encoded image data to said
15 second encoding format to generate second encoded image
16 data.

1 20. The method of claim 19, wherein the generated image
2 content information indicates the pictorial content of an
3 image.

1 21. The method of claim 20, wherein the additional image
2 content information includes a description of the pictorial
3 content of at least one image.

1 22. The method of claim 20, wherein the step of
2 re-encoding said first encoded image data includes:
3 decoding said first encoded image data to
4 generate decoded image data; and
5 re-encoding said first encoded image data using
6 at least one encoding parameter generated as a function of
7 said generated image content information.

1 23. A system for processing image data for storage and
2 retrieval purposes, the system comprising:
3 a scene analysis module for performing scene
4 analysis on said image data to generate image content
5 information;
6 means for receiving additional image content
7 information from a user of the system;
8 an encoder for encoding said image data according
9 to a first encoding format to generate first encoded image
10 data; and
11 a storage device for storing the first encoded
12 image data, said generated image content information and
13 said additional image content information in a file.

1 24. The system of claim 23, further comprising:

2 means for retrieving from storage the stored
3 first encoded image data, said generated content
4 information, and said additional content information;
5 means for selecting, as a function of at least
6 one of said generated content information and said
7 additional content information, a second encoding format to
8 be used for outputting images represented by said first
9 encoded image data; and

10 a second encoder for re-encoding said first
11 encoded image data to said second encoding format to
12 generate second encoded image data.

1 25. A system for processing data including at least one of
2 image data and audio data, the system comprising:

3 an analysis module for analyzing data to be
4 encoded and to assign one of a plurality of encoding levels
5 of complexity to the data to be encoded;

6 an encoder for generating encoded data from said
7 data to be encoded;

8 a file wrapper module for incorporating an
9 encoding complexity level identifier indicating the
10 encoding complexity level assigned to said data to be
11 encoded and said encoded data into a single file; and
12 a data storage device for storing said single
13 file.

1 26. The system of claim 25, wherein the encoded data is
2 encoded image data, the system further comprising:

3 a preview module coupled to said encoder and said
4 analysis module for displaying a subset of the images

1 27. The system of claim 20, wherein the preview module
2 selects images represented by image data assigned a higher
3 than average encoding complexity level for display.